

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2004/001378

International filing date (day/month/year)
26.03.2004

Priority date (day/month/year)
26.03.2003

International Patent Classification (IPC) or both national classification and IPC
G01V1/28

Applicant
WESTERGECO SEISMIC HOLDINGS LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl
Fax: +31 70 340 - 3016

Authorized Officer

De Bekker, R

Telephone No. +31 70 340-4094



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001378

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001378

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-4,6,9,13,16
	No: Claims	1,5,7,8,10-12,14,15,17-19
Inventive step (IS)	Yes: Claims	
	No: Claims	2-4,6,9,13,16
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

- 1 The following documents are referred to in this communication:
D1 : FR 2 553 522 A (GEOSTOCK) 19 April 1985 (1985-04-19)
D2 : WO 03/023451 A (INPUT OUTPUT INC) 20 March 2003 (2003-03-20)
D3 : US 6 430 105 B1 (STEPHEN GORDON) 6 August 2002 (2002-08-06)
D4 : WO 01/53854 A (SCHLUMBERGER CA LTD ; SCHLUMBERGER
HOLDINGS (CA); SCHLUMBERGER SERVICE) 26 July 2001 (2001-07-26)
D5 : GB 2 309 082 A (GECO AS) 16 July 1997 (1997-07-16)

2 INDEPENDENT CLAIM 1

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (see references in the search report):
a method of processing seismic data, in that a frequency spectrum is calculated from data detected by an accelerometer to obtain information about the earth's subsurface related to the state of consolidation in between the wells which host the respective source and accelerometer receiver.
- 2.2 Furthermore, it is noted that D2 discloses a vertical seismic imaging method (processing) based on data acquired by means of accelerometers, having a wider dynamic range as compared to conventional sensors and which additionally can provide a linear frequency response across a wide frequency spectrum, especially high frequencies, to obtain information about the earth's subsurface for reservoir monitoring.
And as such the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
- 2.3 Additionally it is noted that Document D3 discloses (Fig.4; col.5, ln.46- ln.54) the detection of the acceleration wavefield by accelerometers and the directly processing of the same for analysis.
And as such the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new.

- 2.4 Document D4 discloses (pg.7, ln.1-10) the spatial filtering of densely acquired acceleration data in the processing for seismic wavefield separation. As such the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new.

3 INDEPENDENT CLAIM 10

- 3.1 Since the subject-matter of claim 10 relates to an apparatus for implementation of the processing method of claim 1, the documents mentioned above in paragraphs 2.1-2.4 this claims equally anticipated regarding the lack of the novelty.
As such the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 10 is not new in the sense of Article 33(2) PCT.

4 INDEPENDENT CLAIMS 17, 18 and 19

- 4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17, 18 and 19 is not new in the sense of Article 33(2) PCT.
Since the subject-matter of claim 17, 18 and 19 refers to a program as well as a storage medium holding the same
Document D1 discloses (the references in parenthesis applying to this document):
accelerometer for detecting state of consolidation in between wells

5 DEPENDENT CLAIMS

5.1 DEPENDENT CLAIMS 2-4

Although the combination of the features of dependent claims 2-4 are not explicitly disclosed by the available prior art, it is considered that the subject-matter of said claims do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

Since D2 clearly states that the data acquired by means of accelerometers, having a wider dynamic range as compared to conventional sensors and which

additionally can provide a linear frequency response across a wide frequency spectrum, especially high frequencies, it would be an obvious step for the skilled man to adjust the filtering requirements of the processing to the signal-to-noise characteristics of the acquired data without exercising any inventive skills.

5.2 DEPENDENT CLAIMS 5-9, 11-16

Dependent claims 5-9, 11-16 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.